## REMARKS

By this amendment, claims 1, 2, and 6-11 are revised to place this application in condition for allowance. Currently, claims 1-11 are before the Examiner for consideration on their merits.

First, claims 6-11 have been revised to address the instances of indefiniteness noted in the rejection based on 35 U.S.C. § 112, second paragraph. This rejection is believed to be overcome by these amendments.

Second, claims 1 and 2 are revised to close the claim to the listed alloying elements by changing "comprising" to "consisting of".

Turning now to the prior art rejection, the Examiner rejects claims 1-5 under 35 U.S.C. § 102(b) based JP 11-140601 (JP '601) and claims 6-11 under 35 U.S.C. § 103(a) based on the same reference. For claims 1-5, the Examiner contends that the composition is taught and for claims 6-11, the Examiner submits that the claimed processing steps are disclosed or obvious based on JP '601.

Applicants respectfully traverse the rejection of claims 1-5 based on the argument that the composition of JP '601 neither anticipates claim 1 nor renders this claim obvious. Moreover, the processing steps found in claims 6-11 are not found in JP '601. The traverse is set out based on the rejected claims.

CLAIMS 1-5

By the revision to claims 1 and 2, the issue of patentability now becomes whether JP '601 teaches the composition as it is now limited by the term "consisting of." Applicants submit that JP '601 can neither anticipate nor render claims 1 and 2 obvious

for the simple reason that JP '601 requires Ti as an essential alloying element and this element is not included in claim 1.

In JP '601, Ti is disclosed as being present in the range of 0.01% to 0.06 wt.%, see claim 1 of this reference. In paragraph [0016] of JP '601 it is stated:

> Ti solidifies C and S into a coarse compound of $Ti_4C_2S_2$, thereby prohibiting precipitation of MnS which causes to prevent the movement of a magnetic domain wall, and solidified N into TiN compound to facilitate the movement of the domain wall and to ease a ferrite crystal grain growth, then, brings a good magnetic shield effect against geomagnetism.

This paragraph of JP '601 also states:

> When the addition of Ti content is less than 0.01%, such effects above could not be acknowledged. On the other hand, addition of excess of Ti such as more than 0.06% brings not only to cost increased, but also makes magnetic shield characteristics deteriorate, due to formation of fine compound with P, which will prevent the movement of the magnetic domain wall and prohibit the growth of ferrite crystal grain.

From the above, it is clear that an amount of Ti is essential for achieving the aims of JP '601. Ti must be added in sufficient amounts to solidify almost all the amount of the elements of C, S, and N (each having a bad effect to the magnetic shield) into $Ti_4C_2S_2$ and TiN. JP '601 is explained on page 3 of the application, noting that the presence of Ti in the steel of JP '601 means that the recrystallization temperature is higher, thus increasing production costs. In addition, permeability is degraded due to the presence of carbonitrides that directly prevent the migration of domain walls and reduce the ferrite crystal diameter, see page 3, lines 5-9.

It should also be understood that increasing strength through the use of precipitation strengthening elements such as Ti brings a compromise in permeability, see page 2, lines 2-5.

The invention is the discovery of a steel sheet that can have high yield stress and good permeability without the need for alloying elements such as Ti and Si, see page 3, the last four lines, of the specification.

Claim 1 defines a steel which does not require Ti, but has a yield stress of 300 $N/mm^2$ and ferrite crystal grain diameter of 10-100 microns. Claim 2 defines a similar steel with the additional requirement of meeting equation 1. Claim 4 further defines the steel in terms of a specific permeability μ0.35 in a DC magnetic field of 0.35 Oe is 400 or higher.

Since claims 1 and 2 are closed to other elements, JP '601 cannot be said to anticipate this claim. That is, JP '601 does not disclose a composition that only has the recited elements. Therefore, the Examiner can only rely on 35 U.S.C. § 103(a) to further reject claims 1 and 2 based on JP '601.

The Examiner may invoke the principle that an element can be removed if its function is not required. However, in this case, Ti is an essential element of JP '601. Therefore, there can be no legitimate reason that one of skill in the art would remove Ti in JP '601 so as to arrive at the invention of claims 1 and 2. To contend that one of skill in the art would remove Ti from the composition of JP '601 would be the blatant use of hindsight and such a rejection could not be sustained on appeal.

Even if the Examiner were to assert that the removal of Ti in JP '601 would be obvious, the invention's ability to combine strength and permeability without the use of Ti is an unexpected result that rebuts any allegation of obviousness. As pointed about above, the steel sheet of claims 1 and 2 has a yield stress of 300 $N/mm^2$ or more. This is coupled with a ferrite crystal grain diameter of 10-100 microns.

While it is true that JP '601 teaches a crystal grain diameter of 10-30 microns, all of the Examples of JP '601 show a grain diameter of 22 microns or less. According to the invention, even when crystal grain diameters of 32 or 62 microns are present, see Steel Nos. 2, 3, and 5 in Table 3 of the specification, the present inventors have found that high yield stress can be obtained with a steel sheet that does require Ti. This is a finding that is completely unexpected given the knowledge of JP '601 and this finding more than rebuts any contention of obviousness.

For claim 2, the presence of the equation is more substantiation of the rebuttal of any obviousness contention. That is, the following the equation is important to enhance a yield stress of 330 $N/mm^2$ or higher in a ferrite single phase without relying on the precipitation of the Ti-system compounds and on the fining of the grain diameter as is the case for JP '601.

In fact, since JP '601 cannot be said to anticipate claim 2 (no alloy is disclosed that is limited to that claimed) the Examiner must address the obviousness of the equation. The Examiner cannot rely on *In re Cooper*, 57 USPQ 117 *(CCPA 1943)* and the principle that if the prior art discloses an alloy that reads on that which is claimed, the equation relating to the composition can be assumed to be met since JP '601 does not disclose an alloy similar to that claimed. Since JP '601 teaches nothing about the control of the amounts of Mn, P, and C, there is no basis to conclude that the equation could somehow be derived from the teachings of JP '601. Therefore, claim 2 is separately patentable over JP '601.

To summarize, JP '601 cannot be said to anticipate claims 1 and 2 since this publication does not teach a steel sheet having the claimed composition. Moreover,

there is no basis to modify JP '601 and remove Ti since it is an essential element of JP '601's composition. In addition, even if obviousness is still asserted, the discovery of a steel sheet with high strength and good permeability without Ti is a surprising one that rebuts any contention of obviousness. Claim 2 is also patentable since there is no basis from which to assert that the equation is obvious.

CLAIMS 6-11

Since each of claims 6-11 incorporates the features of claims 1 or 2, and these claims have been demonstrated to be patentable over JP '601, claims 6-11 are also in condition for allowance.

Moreover, it is argued that the processing relating to the coiling temperature and the relationship between the cold rolling reduction ratio and final annealing temperature is not taught in JP '601 and these method claims are patentable for these reasons.

In each of claims 6-11, the coiling temperature is limited to 600-700 °C. In JP '601, the coiling temperature is taught to be not less than 700 °C with an explanation in paragraph [0018] that says "the coiling temperature is to be not less than 700 °C in order to restrain a fine precipitations of C and N which suffocates the movement of a magnetic domain wall, and to prevent of deterioration of a magnetic shield characteristics by prohibiting the growth of ferrite crystal grain." In all the Examples of JP '601 with the exception of Comparative Example 3, the coiling temperature is not less than 710 °C. Comparative Example 3, by identifying 590 °C as an undesirable coiling temperature, teaches that one would not use a temperature lower than 700 °C as required in claims 6-11.

The difference in coiling temperature between the invention and JP '601 comes from the fact that the steel sheet of the invention has no Ti, which will raise the recrystallization temperature of the steel. In the present invention, it is intended to control the crystal grain diameter during the recrystallization annealing by obtaining a growth of AlN particles with progressing a sufficient precipitation of AlN at the time of coiling the hot rolled strip at the specified coiling temperatures, see paragraphs [0044 and 0045] of Applicants' published patent application. Therefore, it is submitted that this aspect of the method is not taught.

JP '601 also fails to teach the relationship between the reduction ratio and final annealing temperature. In JP '601, a cold rolling reduction ratio of 60-90% is adopted for the reason that "at least 60% is necessary for the purpose to conduct efficiently an acid pickling, but excess ratio more than 90% is not actual due to excess loads being charged", see paragraph [0019] of JP '601. However, there is no teaching in JP '601 of the relationship between cold rolling reduction ratio in the final cold rolling and a final annealing temperature. This control is important to the invention and the ability to have the properties of yield stress and high specific permeability together in spite of large ferrite crystal grain diameters, see again Table 3, wherein steels with diameters of 32 and 62 microns still have good permeability and strength.

Since JP '601 cannot be said to teach the processing features of claims 6-11, these claims 6-11 are patentable based on their method steps as well as their dependency on patentable claims 1 and 2.

SUMMARY

In light of the change to claims 1 and 2, these claims along with their dependent claims 3-11 are in condition for allowance. JP '601 cannot anticipate or render these claims obvious for the simple reason that the composition of claims 1 and 2 is not disclosed or suggested. In addition, the surprising results associated with the inventive steels of claims 1 and 2 means that any allegation of obviousness is effectively rebutted. Claims 6-11 are separately patentable over JP '601 on the grounds that the processing steps are not taught by this reference.

Accordingly, the Examiner is requested to examine this application in light of this amendment and pass all pending claims onto issuance.

If the Examiner believes that an interview would be helpful in expediting the allowance of this application, the Examiner is requested to telephone the undersigned at 202-835-1753.

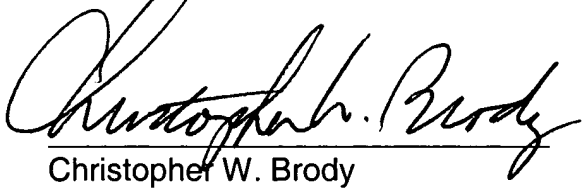
The above constitutes a complete response to all issues raised in the Office Action dated February 26, 2008.

Again, reconsideration and allowance of this application is respectfully requested.

A petition for a one month extension of time is made and a check in the amount of $120.00 is attached to cover the petition fee.

Please charge any fee deficiency or credit any overpayment to Deposit Account No. 50-1088.

Respectfully submitted,
CLARK & BRODY



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